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Generative Music Editorial

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Algorithmic composition, automated composition, meta-music, process and systems music, generative music, adaptive and procedural audio — all these terms indicate the extent to which composers have become conscious of system-building. Whilst the grand history of music attests that formalism is not a new idea of the computer era (Roads 1996, Loy 2007, Essl 2007), energetic exploration has certainly been facilitated by computers.

Generative music itself is to some just a fashionable relabelling of realtime algorithmic composition, dating to publicity circulating around Brian Eno's work in the mid 1990s, particularly the 1996 *Generative Music 1* installation/program release built with the Koan software. To others, generative music is a broad conceptual category within generative art. Boden and Edmonds (2009) suggest that generative music might encompass any rule-based system, no matter how subjective the rules, and thus take in Stockhausen's *Aus den sieben Tagen* text pieces (1968). In a more contemporary sense, generative music is a subset of computer-generated music (CG-music in their parlance) that requires the construction of objective programs which embody rules, and is thus strictly formal in the sense of being computable. In raising such distinctions, we see how the broad church of generative music can accommodate many interesting debates on the role of technologies and human beings in art.

The emergence of generative music as realtime computational music making has been stimulated by the wide availability of powerful computers. The paradigmatic manifestation of current generative music involves a computer program that can produce novel music on demand, such as the Koan software, the MadPlayer, Lexikon Sonate, and many others. Along with the production of stand-alone music systems, generative music has in recent years played an important role in live coding (human performer-programmers rewriting algorithms on stage) and interactive music systems including computer games.

Generative music is now mainstream. The process of generating algorithmic music by computer is now ubiquitous, generative music has been the basis for works by popular musicians, there are dedicated hardware devices that create generative music, and it is widely used in computer games. This edition touches on a wide range of the territory occupied by generative music including academic research, experimental practice, commercial applications, and more. Despite this widespread usage generative music is still not widely understood, certainly not ubiquitous, and there are many developments and issues to be explored.

Generative computer music builds on a rich history of generative processes in the creative arts; these might take place using only text instructions or paper, as in compositions by John Cage or the conceptual visual art pieces of the 1960s and 70s. These practices have shown that instruction sets are often provocative and engaging catalysts for creative practice.

While it is often productive to separate the algorithmic and computable from the conceptual and intuitive, rule-based work straddles both domains. There is a continuum based on the fuzziness and definition of the rules and where the interventions of the human authors exist in the process. However, we suggest that these divisions are less distinct than might be evident to the audience for the work. For even if algorithms, in the computer science sense, must be well-defined without reliance on human whimsy, humans are still the coders, any interactive generative system involves human agency, and humans still interpret

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the resulting works.

Debate surrounds how generative music should be reconciled with algorithmic composition, indeterminism, conceptual art, or indeed, the rich and vibrant demo scenes and computer cultures within which so much contemporary digital arts unfolds. Algorithmically uneducated critics have often derided much digital art as exhibiting 'randomness', though this view is essentially naive, showing an ignorance of probability theory. The aesthetic affordances of process have been a concern through the history of generative music, perhaps even more than in generative visual art, and the concerns about the "musicality" of particular processes and the balance between algorithm autonomy or human control continues to be debated. Algorithmic composers have developed an array of compositional techniques using, for example, controlled probability distributions, heuristics, formal grammars and connectionist architectures, to name a few. The demands of realtime generative music allow the adoption of some of these processes but also present challenges that require the exploration of new compositional strategies.

Generative music has its critics. In his keynote for the 2008 International Computer Music Conference Trevor Wishart derided 'evidence that algorithm is doing its stuff' since 'for me its not music'. He later qualified this to state that the investigation was not valueless, but it just wasn't music making. Live coders might beg to differ, but even they must acknowledge the corporeal difference between direct control of a physical instrument and indirect control via program code. More critically still, the process versus product debate lurks here, and the balance between systems building and final result is of great interest. Recently, authors have been turning against systems building for its own sake (Hedelin 2008, Roads 2009), leading to a greater consideration of psychological apprehension afforded by particular algorithms and the ways they are utilised.

Indeed, there are plenty of questions raised by generative music for us to confront. Given that it would take many lifetimes to listen to a fraction of all the fixed recordings out there, why bother to create any generative works for consumption at all? Isn't the ultimate device one with a play button that provides different output each time it is pressed; like a radio with an on-off button that samples through the space of humanity's generative cultural productions?

A consideration of how we might analyse random outpourings from culture may prove a useful thought experiment. The thematic coverage of any particular radio station may be circumscribed, but switching between all available streams provides a massive diversity of music; yet this is not the product of a rule system from an individual's conception, but a side effect of our richly productive times. In contrast, perhaps composers of generative music still seek an identity and validity in their own algorithmic works, exactly because the mass outpourings of a unique system exemplify a novel search strategy for new musical expression.

An issue on generative music in *Contemporary Music Review* allows space to explore many of these controversies, and to explore the rich algorithmic scene in contemporary practice, as well as the diverse origins and manifestations of such a culture. A roster of interesting exponents from both academic and arts practice backgrounds are involved, matching the broad spectrum of current work. Contributed articles range from generative algorithms in live systems, from live coding to interactive music systems to computer games, through algorithmic modelling of longer-term form, evolutionary algorithms, to interfaces between modalities and mediums, in algorithmic choreography. A retrospective on the intensive experimentation into algorithmic music and sound synthesis at the Institute of Sonology in the 1960s and 70s creates a complementary strand, as well as an open paper on the issues raised by open source, as opposed to proprietary, software and operating systems,

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with consequences in the creation and archiving of algorithmic work.

These articles are accompanied by a series of eleven artists' statements we solicited, to further reflect the broad paths open to the generative music adventurer.

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